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20 September 1979

East Europe Report

SCIENTIFIC AFFAIRS

No. 643

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This serial report contains press and radio coverage on the development of and progress in the various theoretical and applied scientific disciplines and technical fields; and the administration, structure, personnel, and research plans of leading East European scientific organizations and institutions, particularly the academies of sciences.

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EAST EUROPE REPORT

SCIENTIFIC AFFAIRS

No. 643

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HUNGARY

BLOOD SERUM OF SOVIET ANTARCTIC PERSONNEL STUDIED

East Berlin DAS DEUTSCHE GESUNDHEITSWESEN in German Vol 34 No 27, 1979
pp 1268-1272 manuscript received 5 Mar 79

[Article by Dr L. Klinker, Research Institute for Bioclimatology, GDR Meteorological Service; Ellen Walther and Birgit Bomski, Bad Elster Research Institute for Balneology and Health Resort Science; and Dr S. Kunkel, University Women's Clinic, Rostock. The study is part of the research program of the GDR Academy of Sciences Central Institute for Earth Physics, Potsdam: "Study of Selected Parameters in the Serum of Healthy Test Personnel During the 29th Soviet Antarctic Expedition"]

[Abstract] Variations in the serum value of certain immunoglobulins, free thyroxine (FT_4) and unconjugated 11-hydroxycorticosteroids were tested for between May and December. Subjects were healthy men, between 25-35 years old. Blood was collected at 1 month intervals from 3 subjects and at weekly intervals from 1 subject always at the same time of day. Serum was obtained by sedimentation and was subsequently frozen. The subjects lived in heated quarters, spent 10-30 minutes daily outside, their quarters had windows. Results: Immunoglobulins (IgG, IgA and IgM) showed no systematical changes in the course of the study although some of the values were considerably higher than normal. The values were so much at random that, instead of environmental factors, they rather appear to have been influenced by individual stresses (ex: infections). The FT_4 values varied between 5.5 and 11.0. They tended to decrease up to the end of June and increase again from early August. There may possibly be some correlation between the length of daylight hours and FT_4 values. The 11-hydroxicorticosteroid values were useless because the experimental conditions could not be maintained in a satisfactory manner. References 9: 4 GDR, 5 Western

CSO: 2302

NEW TECHNOLOGIES, INSTRUMENTS, MATERIALS APPROVED BY ACADEMY OF SCIENCES

Sofia SPISANIE NA BULGARSKATA AKADEMIYA NA NAUKITE in Bulgarian No 3, 1979 pp 103-107

[Unattributed report: Some BAN [Bulgarian Academy of Sciences] Developments Applied or Presented for Application in 1977-1978"]

[Text] The Consolidated Center for Mathematics and Mechanics has set up the KONSPIR program system which covers the method, algorithms, and an applied programs packet (PPP) for the automatic designing of the entire cycle--from design to mechanical processing of conical transmissions with spiral cogs. The method has high indicators and is 100 percent ready for production. In 1978 it was applied at the Balkankar DSO [State Economic Trust], G. Petrov Plant in Sofia.

Another effective development of the ETsMM [Consolidated Center for Mathematics and Mechanics] is the "Application of Electronic-Computer Equipment (EIT) in drafting and designing transportation systems." It was developed on the basis of a contract initialed with the INTRANSMASH Bulgarian-Hungarian company, and was put by it to practical use.

A "Packet of Applied Programs for Counting and Controlling Labor Outlays in Agroindustrial and Industrial-Agrarian Complexes and State Farms" was developed (based on a contract with the Ministry of Agriculture and Food Industries), and applied in Vratsa Okrug.

In 1978 the Ministry of Metallurgy and Mineral Resources accepted for practical utilization a method for determining changes in the plastic properties of metals following preliminary plastic treatment. This method is of essential significance in controlling the output of our metallurgical combines.

A substantial percentage of such developments may be effectively multiplied in other areas.

In the period under consideration the Consolidated Physics Center directed its activities mainly toward the application of some of its developments in the field of nuclear power industry. The more important among them were the following: "Program for Fast Action and Precharging of Nuclear Fuel," which saves 180,000 leva; "Equipment for Determining the Extent of Combustion of Nuclear Fuel," saving 60,000 leva, etc.

A complete set of work documents was drafted and submitted for application by the Ministry of Agriculture and Food Industry for a mobile gamma system for presowing radiation of seeds and the prevention of budding in potatoes and onions. The developed radiation system is an original creation and enjoys a number of advantages compared with similar existing systems used in the socialist and western countries.

The following developments were applied:

a. Reinforced polyethylene fabric for the building of light-weight farm structures. In 1978 this resulted in savings totaling 480,000 leva from 12 experimentally produced light-weight farm structures. The trend is toward increasing this output in subsequent years. This was the base for the creation of the new Polimerstroy Scientific-Production Trust;

b. The Institute for General and Inorganic Chemistry developed an original method for increasing the durability of instruments and parts through the application of diffusion boron lining. This has created a great deal of interest in the USSR and a number of western companies. The State Committee for Science and Technical Progress awarded a "K" rating to this equipment. Currently it is being applied at the Ikhtimanska Komuna State Industrial Enterprise in the manufacturing of hard alloy nozzles for the extrusion of steel wire. The extensive use of this technology in the enterprises of the Ministry of Machine Building and elsewhere may have a multiplication effect totaling millions of leva;

c. The Central Laboratory for Electrochemical Electric sources developed in 1978 the TsV-500 zinc-air element for work in maritime light signs. The laboratory prototypes are equipped with batteries of varying capacity. The results of the tests have confirmed the suitability of the elements which far exceed the results of traditional sources. The elaboration of a comprehensive program for the regular production of this element is underway;

d. Technology for brilliant acid copper lining has been applied in yet another five Bulgarian plants and sent for semi-industrial testing to Sao Paulo in Brazil;

e. Developments of flexible printed circuits and flexible cables by the Central Laboratory for Photographic Processes (TsLAFOP) applied in the laboratory, and used by the Ministry of Electronics and Electrical Engineering are very promising. Other countries have shown an interest in them as well;

f. Additive for copper lining printed circuits with metalized openings--Medanit--applied at the chemical plant in Kostenets. In terms of its parameters this additive is superior to the American Cubat additive used in our country. The USSR, the GDR, and Czechoslovakia have shown an interest in it;

g. In two years alone the Krasnaya Zvezda Factory in Vladaya of the Ministry of Chemical Industry has applied 14 developments of the Consolidated Center for Chemistry.

The applied science achievements of the Consolidated Center for Earth Sciences were directed toward the fields of cosmonautics, geology, oceanic research, environmental protection, etc.

a. The Central Laboratory for Space Research developed five instruments which were installed with the help of Bulgarian specialists aboard the Vertikal-6 and Vertikal-7 geophysical rockets and launched, respectively, in 1977 and 1978, from a rocket sounding station in the USSR. The results of the work of this equipment were rated highly;

b. The same laboratory developed two other space instruments which were launched aboard the Indian Centaur II rocket on the basis of the Bulgarian-Indian governmental agreement on joint space studies;

c. Specialized maps of Bulgaria and neighboring territories were charted and used in accordance with the governmental decision for a new seismic zoning of the country. The purpose of this zoning is to protect the life of the population and buildings and equipment in earthquakes;

d. Effective methods were developed and applied for the reinforcement of weak (loess) earth foundations of buildings and equipment. Such methods were used in the construction of a number of housing and industrial buildings, television towers, etc., thus reducing construction costs, increasing the number of high rise stories, achieving greater antiearthquake safety, etc.;

e. The results of the Kamchiya program are being used in planning Black Sea coastal construction.

The main scientific accomplishments of the Consolidated Center for Biology were focused, above all, on the preservation and multiplication of vegetable and animal resources.

The scale of the application of the results obtained in the study of tomato heterosis before and during the past two years may be seen by the following achieved results;

- Eighty percent of the areas planted in our country in early tomatoes for export were with the Triumf, Pioner and other hybrids developed by the collective;

- Fifty percent of the medium early production of tomatoes for the canning industry used the Druzhba and Preslav strains.

In the past two years new production conditions were developed and tested and the following hybrid tomato varieties were used:

a. The Ogosta direct and determining strain which was used in 1978 on about 15,000 decares; over 20,000 decares will be planted in this variety in 1979. This resolves the problem of supplying the canning industry with high-quality, inexpensive raw materials for high-quality peeled tomatoes for export to the capitalist countries. About 15,000 tons of such tomatoes were exported in 1978;

b. The high grade early Kristi and Testa hybrids resolve the problem of early tomato production for export to socialist and capitalist countries. This year such hybrids will be used for the production of hybrid seeds for about 20,000 decares;

c. The Trakiya hybrid, suitable for greenhouse production, will replace the currently used Dutch hybrids. Its use will save annually over 100,000 in foreign currency spent on seeds purchased from the Netherlands.

The development assistance and technologies related to the intensification of the multiplication process and artificial insemination of sheep, cows, and pigs is of major economic significance. As a result of the application of such achievements, in 1978 additionally over 60,000 lambs or over 1,200 tons of meat were produced.

In 1978 a new technology for artificial insemination was developed and used on 600,000 sheep. The technology for the manufacturing of sequins for the artificial insemination of cows has been improved and perfected. It has been submitted for application and substitution of imported sequins.

Muskotoks, an insecticide for flies has been developed and applied. It destroys the fly's imago and has a strong larvicide effect. The expected economic savings total 310,000 leva.

New instruments and apparatus have been developed and applied for biological research such as the fast spectrophotometer-176 and the Skrib-177 system.

The results of the application activities of the institutes of the Scientific Trust on Basic Province of the Technical Sciences have been considerable.

The Institute of Technical Cybernetics and Robotics developed the "Automated System for Operative Control of Industrial Automotive Transportation--Astra-78" for the Elatsite Copper Concentration Combine, more advanced than the Astra-71 used at the Medet Copper Concentration Combine.

The same institute completed and modernized the development of an automated system for instruction, knowledge control, and testing based on the Ekzatest testing method, for 30 students. It obtained the "1" state rating. The production of the system was mastered by the automation and telemechanics plant in Sofia.

In 1977 the installation of automatic machines for testing the Intertest logical structures was completed as the result of Bulgarian-Soviet developments (applied at the computer plants in Stara Zagora and Plovdiv).

The Institute of Metal Studies and Metal Technology carried out expanded industrial studies with 100 tons of new nitrogen fire-resistant steel--20Kh22AN5S2--for work at maximum working temperatures of 1,100°C. The new fireproof steel is being regularly produced and its operational qualities are better by a factor of 3 compared with the fireproof steel of 20Kh22112452 steel used so far.

The use of high-strength steel developed by the IMTM [Institute for Metal Studies and Metal Technology] by industry is based on the coordination program entitled "Expanded Application and Study of Low-Alloy Nitrogen Structural Steel." An 80 percent first grade output was achieved at the Lenin Metallurgical Combine using steel 10G2SAF17G2SAF at rolling mill 500-2.

The blowing of liquid steel with gas (nitrogen) with a view to alloying and cleaning the metal was achieved on an industrial scale. A medium carbon variant of nitrogen steel was developed as well.

The Institute for Water Problems developed the "Automated System for Computing Stresses and Deformations of Massive Elements" which was applied in the designing of a number of dams. Its application at the Asenovets Dam alone saved 60,000 leva.

The Nivoregulator [Level Control] signaling equipment was developed and applied in level measuring at the Dragalevtsi Water Reservoir.

The Central Laboratory for Physical-Chemical Mechanics applied or made ready for application the following scientific achievements:

1. A new fast-hardening composition for sealing linings of internal and external walls. This avoids the shortcomings of the plaster of paris solution used so far. This development was applied by the Ceramics and Marble Lining Construction Administration (SUKMO) of the Ministry of Construction and Construction Materials. The SUKMO scientific council suggested that this development be awarded a "K" rating. Its planned annual savings total 165,000 leva.

2. A license for developed "Fast-Hardening High-Durability and Expanding Cements" was sold to the Partek Company in Finland. The application of this

development at the Partek plants entirely confirmed its high qualities. So far 12 foreign firms have written to the Tekhnika Foreign Trade Enterprise expressing an interest in this development. The development was accepted for use by the Ministry of Construction and Construction Materials and is being observed on a national scale. It may yield savings of 3 million leva and 150,000-200,000 tons of cement.

3. The developed "Polymer Concrete Slabs" for anticorrosion and wearproof covers were tested industrially and proved superior to slabs familiar in our country and used domestically and abroad. On the basis of the tests an assignment was formulated and a shop will be built for their regular production by the Industrial Construction DSO. Their use instead of existing roofing will save 1,890,000 leva.

4. On the basis of studies conducted on the durability of polymers at the Khidravlika plant in Kazanluk, five new parts were put to production use, saving 83,000 leva; three more parts, resulting in further savings, will be applied as well.

5003
CSO: 2202

NEW BULGARIAN ELECTRONICS PRODUCTS

Sofia TEKHNICHESKO DELO in Bulgarian No 2, 1979 pp 71-72

[Article: "New Products and Materials"]

[Text] Monolithic Quartz 10.7 MHz Filter

The monolithic quartz 10.7 MHz filters are made up of several double-mode quartz resonators with minimum temperature-frequency coefficient, connected to a cascade. The principle of energy capture and electroacoustic coupling is used. The great advantages of these filters are the small size and weight, compactness, high reliability, great stability of temperature characteristics, low insertion loss, minimum aging. The monolithic filters find application in USW radio sets, radiotelephones and other radio communication equipment as intermediate-frequency 10.7 MHz filters with high selectivity.

Producer: Electronic Transducer Element Plant, Sofia 1738, telephone 76-83-91, Telex 22-623.

Exporter: "Izotimpex"--Sofia, Chapaev Street 51, telephone 73-61, Telex 022731.

Table 1

	Parameters		Type			
			MCF 10,7—15C	MCF 10,7—15	MCF 10,7—15E	MCF 10,7—75E
(1)	Номинална честота	MHz	10,7	10,7	10,7	10,7
(2)	Лента на пропускане на ниво 6 dB	kHz	±7,5	±7,5	±7,5	±3,75 на ниво dB (12)
(3)	Затихване	dB	60	60 80	75 90	75 90
(4)	Неравномерност в лентата на пропускане	kHz	±22,5	±15 ±20	±15 ±17,5	±8,5 ±10
(5)	Максимално внесено затихване	dB	2	2	2	2
(6)	Товарен импеданс	kΩ	3	4	5	5
(7)	Гарантирано затихване ± 300 kHz	dB	3	3	3	2,2
(8)	Канално отстояние	kHz	60	80	90	90
(9)	Работен температурен интервал	0°C	25	25	25	12,5
			—20÷+70	—20÷+70	—20÷+70	
			—40÷+70	—40÷+70	—40÷+70	—40÷+70
(10)	Размери на корпуса LxWxH	mm	15/12/15	18,5/12/15	23/12/15	23/12/15
(11)	Маса	g	7	8	5,5	10

Key:

1. Rated frequency
2. 6 dB level passband
3. Damping
4. Nonuniformity in passband
5. Maximum insertion loss
6. Load impedance
7. Guaranteed damping ± 300 kHz
8. Channel separation
9. Operating temperature range
10. Dimensions of body LxWxH
11. Mass
12. ± 3.75 of dB level

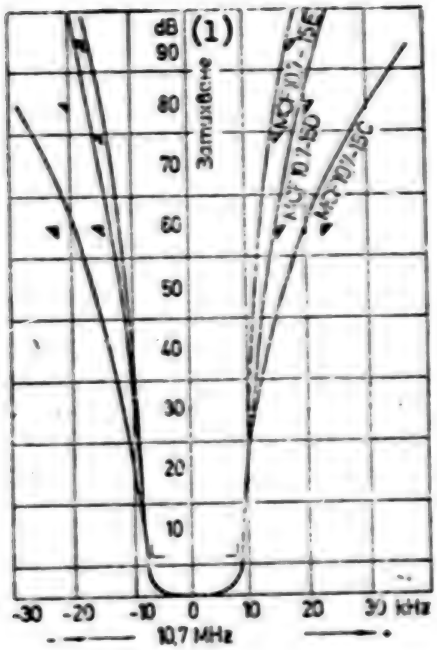


Figure 1

Key: 1. Damping

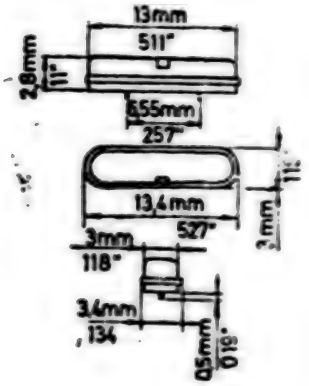
SOM-32 Type Watch Quartz Resonator

The watch quartz resonator is designed for incorporation into electronic wristwatches. These resonators have many qualities that account for their employment in the watch industry, viz., minimum size, good mechanical strength, low impedance. The resonator type here offered has a simple design, which assures manufacturing precision, and great reliability. The small size of the legs permits direct mounting, which is especially important in designing the module.

Their technical parameters are as follows:

Frequency	32.768 Hz at C_{sec}=20 pF, T=25° C, U=40 mV,
Tuning precision	$\pm 20 \cdot 10^{-6}$,
Q factor	$\geq$ 100,000,
Equivalent series resistance	$\leq$ 10 kΩ,
C_1--dynamic capacity	min 0.005 pF,

C_0--static capacity	2.6 pF,
Rotation temperature	$25^{\circ}\pm3^{\circ}$ C,
Temperature coefficient	max $4\cdot10^{-8}/^{\circ}$C,
Aging	$\leq 2\cdot10^{-6}$/year.



Producer: Electronic Transducer Element Plant, Sofia 1738, Telex 22-623, telephone 76-83-91.

Exporter: "Izotimpex"--Sofia, Chapaev Street 51, telephone 73-61, Telex 022731.

TVK 30 Si and TVK 30 Si 6 Types of Silicon Rectifying Stages

The silicon rectifying stage is designed to produce final-anode voltage and voltage for the focusing electrodes of the kinescope in color-picture television receivers. The stage consists of five or six silicon high-voltage diodes and five 2.5 nF, 10 kV capacitors connected in a multiplying circuit and suffused with a suitable epoxy compound. The multiplying circuit that is used has important advantages:

a) The horizontal deflection transformer uses an 8.6 kV coil instead of a 25 kV;

b) There is no need for a rectifying and balance tube;

c) There is no need for a supplementary rectifier for focusing voltage, which in this case is stably connected with the high voltage;

d) The stage rectifiers are insensitive to interference pulses.

The reliability of television receivers is increased significantly as a result of these advantages.

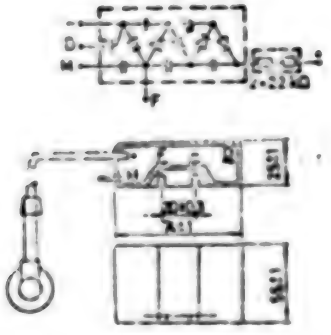
Producer: Electronic Transducer Element Plant, Sofia 1738, telephone 78-85-11, Telex 22-623.

Exporter: "Izotimpex," Sofia, Chapaev Street 51, telephone 73-61, Telex 022-731.

	(1) Параметри	(2) Работни	(3) Абсолютни гранични
(4)	Входящо импулсно напрежение	8,6÷9,4 kV	10,4 kV
(5)	Изходящо напрежение	25÷27,5 kV	30 kV
(6)	Изправен ток	0—1,5 mA	0,4 mA
(7)	Ток на извод фокус	0,3 mA	2 mA
(8)	Вътрешно съпротивление	≤1,5MΩ	
(9)	Околна температура	−20÷+60°C	65°C
(10)	Ток през извод *D*	3,5 mA	4 mA

Key:

1. Parameters
2. Operating parameters
3. Absolute limit parameters
4. Input pulse voltage
5. Output voltage
6. Rectified current
7. Current of focus lead
8. Internal resistance
9. Ambient temperature
10. Current through lead D



Type DK 10.7 B 10.7 MHz Quartz Discriminator

It is designed to function as a discriminator of frequency-modulated signals in high-selectivity radio communications equipment that uses an intermediate frequency of 10.7 MHz with a deviation of 15 kHz and a channel separation of 25 kHz. It needs no additional tuning since it is tuned by the producer. Its distinctive feature is its small size, which is standardized with that of the monolithic quartz filter. This makes it suitable for incorporation into all types and especially into portable radiotelephones and radio sets. Its leads are suitable for direct mounting on a 1.25-size printed circuit board.

The technical parameters of the product are as follows:

Nominal frequency f_{nom}	10.7 MHz
Zero frequency f_0-f_{nom}	±500 Hz
Steepness of characteristic S	50 mV/kHz
Width of work tape of discriminator filter Δ fwd	15 kHz
Nonlinear distortion in passband	≤ 5%
Basic dimensions	23 x 12 x 15 mm
Operating temperature range	from -40 to +70° C.

Producer: Electronic Transducer Element Plant, Sofia 1738, Telex 22-623, telephone 76-83-91/2,3.

Exporter: "Izotimpex," Sofia, Chapaev Street 51, telephone 63-71, Telex 022731.

Synthetic Quartz Single Crystals

Synthetic quartz single crystals are the basic raw material in the production of piezoelectric quartz instruments. Their excellent qualities fully approximate natural single crystals and make possible replacement of this depleted raw material for the electronics industry.

The crystals are left-oriented and are produced in two groups with Q factor of 1,000,000 and 1,800,000.

Producer: Electronic Transducer Element Plant, Sofia 1738, telephone 76-85-11, Telex 22-623.

Exporter: "Izotimpex," Sofia, Chapaev Street 51, telephone 73-61, Telex 022731.

6474
CSO: 2202

NEW TECHNOLOGIES DEVELOPED

Sofia TEKHNICHESKO DELO in Bulgarian 28 Jul 79 p 2

[Article: "News of the Bulgarian Academy of Sciences"]

[Text] The Solid-State Physics Institute has perfected a planar-magnetic cathode for cathode sputtering by extending the central magnetic core outside the target (recognized as an invention--Patent No. 36121). Sputtering at a higher vacuum and greater velocity helps improve layer properties and raise the productivity of the equipment. This development is finding use in the application of thin metallic and some semiconductor and insulating layers to a great variety of surfaces (semiconductors, metals, insulators, plastics, leather, paper etc.). It can be used in the electronics, machine-building and other industries.

The Electronics Institute has developed a waveguide dielectric phase-shifter (recognized as an invention--Patent No. 32379) intended to change the electrical length of part of the waveguide transmission channel. As compared with similar existing developments, the device has a simpler design and good input and output matching without additional matching elements. It finds application in laboratory radiophysical measurements and in the development, design, maintenance and repair of SHF office equipment.

The Central Optical Recording Laboratory has produced a laboratory model of a discrete lightguide reflector (recognized as an invention--Patent No. 33037). It is a controlled device for the three-dimensional deflection of light. The device's advantages are compactness and the capability of three-dimensional light deflection with minimum optical loss and low control-signal values due to the lightguide that is used, and high sensitivity when total internal light reflection is disturbed.

The invention can be used in optical storages, in scanning systems, as an element in integrated optics etc.

The Central Physicochemical Mechanics Laboratory has developed a method, jointly with the USSR Academy of Sciences, for producing reinforced

materials and products (recognized as an invention--Patent No. 39650). The articles and materials that are produced have a 30- to 50-percent higher tensile strength and a 35- to 120-percent higher torsional strength than those produced by methods hitherto known.

The development has wide application in various sectors of industry and construction.

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CSO: 2202

BRIEF REPORTS ON NEW PATENTS AND INVENTIONS

Sofia ELEKTROPROMISHLENOST I PRIBOROSTROENE in Bulgarian No 2, 1979 p 73

[Article: "Patents and Inventions"]

[Text] Patent No. 23200. Method for Obtaining Uniform Metallic Layers on Large-Area Glass Plates. Engineer Aleksandur B. Ivanchev, Engineer Vladimir P. Lrazhev, Candidate of Technical Sciences Engineer Ivan N. Petrov, Engineer Pencho Khr. Penchev and Engineer Dobromira L. Cetskovska, Sofia.

The method is characterized by the fact that the metallic vapor flux passes through equalizing screens and is then deposited on the object which moves circularly over the evaporator in a plane perpendicular to a vertical passing through the evaporator. The equalizing screens limit the space free to the vapor to two surfaces, which are separated from each other at any point by an arcing distance calculated according to the equations

$$S = \omega / t_0 \cos^3 \varphi \text{ for a point source,}$$

$$S = \omega / t_0 \cos^4 \varphi \text{ for a flat source,}$$

where ω denotes the rate of angular motion of the plate;

l is the distance of a given point from the rotation axis;

t_0 is the time during which a given point of the surface is over the center;

$\varphi = \operatorname{arctg} \frac{l}{H}$;

H is the distance from the source to the glass surface.

The invention can find application in the manufacture of precision photo templates for industry, in microelectronics etc. The advantages of the method are that it can be used on large-area objects.

Patent No. 23166. Circuit for Linearization of Digital Voltmeter Characteristic. Engineer Raycho M. Raychev, Sofia.

The characteristic features of the circuit are that it contains a decoder whose outputs are connected to a control-voltage forming unit, while its inputs are connected to the last decade of the voltmeter counter. The output of the control-voltage forming unit is connected to a quantizing pulse oscillator of the digital voltmeter.

The circuit can find application in digital measuring technology. Its advantage is its significant simplification as compared with known circuits.

Patent No. 22948. Scale for Line Measuring Transformer. Engineer Aleksandur B. Ivanchev, Engineer Vladimir P. Drashev, Senior Science Associate Engineer Ivan N. Petrov, Kenan I. Mustafov and Engineer Pencho Khr. Penchev, Sofia.

The scale is characterized by the fact that it consists of series-connected scales with milled channels of suitable size and arrangement, connected to each other in a stationary assembly by means of a mechanical fastening element.

The circuit can find application in precision positioning systems and metal-cutting machines. The invention's advantages are that scales of a low precision class are used, the mounting is done by the producer of the scales under optimal conditions and there is no need for additional adjustment after they are mounted on the metal-cutting machines.

Patent No. 25342. Device for Three-Position PD [expansion unknown; possibly pryakodeystvuvashto, direct-acting] Temperature Control with Error Indication Based on Operational Amplifiers. Engineer Velichko St. Dobrinov, Sofia.

The input unit of the device is connected to an operational preamplifier, whose output is connected by a needle error indicator to the inverting input of a "heating" output operational amplifier and to the noninverting input of the "cooling" output operational amplifier. The outputs of the operational amplifiers are connected by key stages to the "heating" and "cooling" output relays respectively, whose outputs are connected to the respective inverting inputs of the output operational amplifiers. The invention is characterized by the fact that the noninverting inputs of the two "cooling" and "heating" output amplifiers are connected via an alternating divider for the deadband to the negative voltage source.

The device can find application in automatic control systems for plastic processing machines, electric thermal-treatment furnaces, agricultural dryers etc. Its advantage is that no shifting of the setting from the deadband occurs, which makes it possible to maintain the desired temperature in the object with high precision.

Patent No. 23201. Method of Fabricating Precision Photo Templates for Line Inductosyns. Engineer Aleksandur B. Ivanchev, Engineer Vladimir P. Drazhev, Senior Science Associate Engineer Ivan N. Petrov, Engineer Iskro Iv. Krivoradev, Kenan I. Mustafov and Engineer Pencho Khr. Penchev, Sofia.

A layer of chromium is deposited on a glass plate by vacuum evaporation, after which a wax layer is applied, the pattern of the photo template is formed with a dividing machine, and thereafter the metal that is unprotected by wax is etched. The method is characterized by the fact that a layer of aluminum is applied directly to the chromium by vacuum evaporation.

The method can find application in the production of line inductosyns. It makes possible the fabrication of precise photo templates for line inductosyns of the highest class of precision.

Patent No. 23422. Circuit for Transient Suppression on the Switching Off of Stabilized Rectifiers. Engineer Svetlozar St. Abadzhiev, Engineer Nedko St. Shivarov and Grigor St. Angelov.

The circuit consists of reverse-synchronized contacts of a TsK [expansion unknown] key, one position of which is normally open. The invention is characterized by the fact that the normally closed contacts of the TsK key are connected to the positive and negative electrode of an electrolyte and are connected via the key to the primary winding of a network transformer.

The circuit can find application in all types of feeders, built-in laboratory modules etc. that cut into and out of the power supply network autonomously. Its advantage is that the possibility of the appearance of surges and undesired oscillations is completely eliminated.

6474
CSO: 2202

BATTERED-CHILD SYNDROME IDENTIFIED IN CASE STUDIES

East Berlin DAS DEUTSCHE GESUNDHEITSWESEN in German Vol 34 No 30, 1979
pp 1409-1412 manuscript received 11 Mar 79

[Article by H. Lange, MD, Department of Radiology; W. Knopp, MD, I. Jecht, MD and R. Thate, Pediatrics Department, Clara Zetkin Hospital, Weissenfels: "Skull Fractures in Battered-Child Syndrome"]

[Abstract] The cases of skull fracture involving infants admitted to a Bezirk hospital have been analyzed with respect to both clinical and anamnestic data. The results are discussed in detail on the basis of available literature data by other, mostly foreign authors, and the final conclusions are presented. This report is deemed important since it is quite possible that injuries which may fall under the battered-child syndrome are not being recognized as such, for lack of general awareness of the problem, because so few publications on the subject reach a large number of readers in the GDR. By describing the criminal handling of children which lead to such injuries, the authors hope to satisfy the justified demand for support by the investigative and legal organs. Of the 20 infants hospitalized with skull fractures, 6 were found to be victims of the battered-child syndrome. Clinical and radiological findings as well as details of the case histories led to the diagnosis. An additional case involving a 17-month old child who died from his battering is described. At a previous admission, battering went undetected as the cause of his injuries. The problems in reaching the correct diagnosis as well as the consequences of failing to do so are discussed in detail. References 51: 8 GDR, 43 Western

CSO: 2302

SCIENTIST VON ARDENNE DISCUSSES HEART DISEASE, CANCER THERAPIES

East Berlin DAS DEUTSCHE GESUNDHEITSWESEN in German Vol 34 No 27, 1979 pp 1253-1258 manuscript received 26 May 79

[Address given 12 December 1978 by Prof Dr Manfred von Ardenne on occasion of awarding to him an honorary MD by Carl Gustav Carus Medical Academy, Dresden, for his promoting of scientific-technical progress in medicine and for health care of the GDR population: "On the Counter-Directional Nature of Measures Involved in a Causal Myocardial Infarct Multistep Therapy and the Cancer Multistep Therapy." The editorial board invites the response of readers to the theses and results presented in the article.]

[Abstract] Continuing in the direction taken by Otto Warburg with his discovery of aerobic fermentation of cancer cells, the author discusses the functional correlations between the concept of myocardial infarct multistep therapy (MIMT) and cancer multistep therapy (CMT). The natural process in localized cell destruction is a diminished oxygen metabolism in the cell leading to a local lowering of pH, loss of elasticity of the erythrocytes and decreased rate of blood flow through the capillaries--which also makes it difficult to transport medication to the site of affliction--leading to cell destruction, necrosis and scar formation. This natural process is representative of the occurrences in myocardial infarct and also is the basis of the CMT. The medical steps taken in myocardial infarct are aimed at the prevention of tissue necrosis while in the presence of cancer a reverse therapy--destruction of the cancer cells--is the aim. The relationship between the two approaches is illustrated by the opposite steps taken in their respective multistep therapies. 1. Infarct: decrease of fermentation by O_2 administration and avoidance of high blood glucose levels. Cancer: stimulation of fermentation by a prolonged, 5-fold increase in blood glucose concentration. 2. Infarct: immediate correction of the lowered pH with g-strophantine. Cancer: lowering of the pH with pharmacons or other means. 3. Infarct: medication to increase erythrocyte flexibility. Cancer: medication to further decrease erythrocyte flexibility at the lowered pH values. 4. Infarct: early administration of a lysozyme stabilizer (ex: methylprednisolone 0.3 g). Cancer: lysozyme labilizer (ex: Vitamin A) administration. 5. Infarct: raising the blood pressure

briefly in order to help improve the stagnating microcirculation. Cancer: use of drugs to strongly lower the blood pressure for a brief period toward the end of local hyperthermia (ex: NAD or sodium nitroprusside i.v.) with the aim to selectively destruct the capillaries supplying the vascular system of the tumor. 6. Infarct: hypothermia would be of advantage. Cancer: local hyperthermia especially by using the CMT selectotherm procedure developed by the author. The only aspect of therapy where infarct and cancer do not call for contrasting measures is the stimulation of body defenses such as phagocytosis and cytolytic chain reaction. Prolonged chemical stimulation of the immune defense system is employed using 2-cyanoethyl urea and 2-cyanoaziridine. This approach raises the prospect of decreasing the infarct mortality from 32 to under 10 percent. The CMT resulted in an additional discovery of great value in geriatrics. It is claimed that, in more than 100 patients, the resting arterial pO_2 was increased to values up to 95-100 mm Hg by 36 hours of an oxygen multistep therapy, the results lasting for months and years. References 66: 62 GDR, 4 Western

CSO: 2302

ACHIEVEMENTS, TASKS OF COMPUTER TECHNOLOGY DEVELOPMENT PROGRAM

Budapest INFORMACIO ELEKTRONIKA in Hungarian No 4, 1979 pp 184-188

/Article by Dr Lorant Nemeth, Director of the National Computer Technology Applications Office, OSZI: "Achievements Thus Far and Future Tasks of the Computer Technology Central Development Program"/

/Text/ Next year, in 1980, we will complete the second five year plan period of the SZKFP /Computer Technology Central Development Program/ and for a year already planning has been going forward for the next phase of the program, for 1981-85, looking forward to 1990. An essential station of this was the preparation of a technical-economic conception on applications of computer technology--adjusted to the prescriptions of the National Plan Office and the time and work order for preparation of the Sixth Five-Year People's Economic Plan.

But in addition to the general periodicity of medium range planning there are internal reasons also that we consider it timely now to review the status we have achieved in computer technology applications, seeking the best path for further progress. It appears that in our day we are approaching the end of a qualitatively unique stage in the domestic developmental history of applications. In the hardly more than 15 years of Hungarian applications of computer technology the initial stage ended in 1970 and a second stage, laying the foundations, developed under the influence of the SZKFP. Within the SZKFP we basically achieved our goals, with suitable concreteness, goals which were individually set and centrally comprehensive. In the eyes of public opinion also computer technology emerged from the unknown and an appreciation of its utility gradually became natural in the thinking of state and economic leaders at various levels.

In the times ahead, with the further numerical growth of applications systems, the following will probably be more essential and more striking:

--an expansion and enrichment (diversification) of the multiplicity of applications,

--an integration of computer techniques into the physical and intellectual processes served by them, and

--a more concrete requirement for the economic and social efficiency of applications.

The probably continuing swift proliferation of applications systems and their multiplicity, extending virtually everywhere, will certainly pose new or modified requirements for the planning and central coordination and guidance methods of the SZKFP.

An analysis of the results achieved thus far and of the future tasks of computer technology applications is defined by and faciliated by the already cited technical-economic conception which was finalized by one year's work by 150 experts, taking into consideration the many observations of affected professional institutions and central state organs, which is to say as a synthesis of the collective knowledge, views and information available.

This conception, I feel, proceeded in a correct direction when--deviating from earlier program documents--it concentrated not on investment aspects or the quantitative data concerning the tools needed by computer technology but rather prescribed the development of further development of user goals and user systems suitable for these goals.

Comprehensive Data Characterizing Development

Still, it might be interesting to characterize the road travelled and the status achieved by listing some data which can be measured and interpreted statistically.

A real, organized development of computerization could begin only after the beginning of 1971, with the beginning of the SZKFP. In the initial stage up to that time our machine park consisted of only 120 units of first and second generation computers, largely of small capacity. By the end of 1978 this had grown to roughly 600 small and larger computers and there will probably be 715 units in 1980. But the machine park is actually substantially greater than this because the mini-computers, which did not exist in 1970, exceeded 400 units by the end of 1978 so the total is 1,000 units.

Using a different unit of measurement, the gross value of the computers, the value now precisely known, which includes acquisitions in 1979-80, has grown from not quite 2 billion forints at the end of 1970 to an expected 18.1 billion by 1980, thus increasing nine times. When we consider the capacity/price indexes, which have constantly improved throughout this period, we can look on the computer technology capacity growth of the country as even a good bit greater. Looking at the series more closely, however, we also see that the average annual growth rate for gross value of equipment was 33.5 percent in the Fourth Five-Year Plan and will be only 16.4 percent in the Fifth Five-Year Plan.

According to official statistical data the useful (productive) machine hours delivered by the computers were 206,000 hours in 1970, 817,000 hours in 1975 and 1.2 million hours in 1977 with the probably figure being 1.8 million

hours by 1980, an annual service value of 809 billion forints. The total service output of one's own and of outside organizations--in a service branch which can be characterized by a low material ratio and a high share of intellectual work--is hardly negligible even today but these data do not express the economic value of the accomplishments.

In the course of working out the conception the experts setting the standards and the professional and state organs came to a basic identity of views in judging the present size and status of domestic computerization, which we will summarize below.

The Achievements Thus Far of the Applications Program

The spread of computer applications and computer technology culture accelerated and became more organized during the fourth and fifth five-year plans within the framework of the SZKFP. Computer technology invaded the most varied areas of administrative, economic and scientific work and of cultural and social life. It is a fundamentally positive tendency that the center of gravity of applications shifted toward applications areas directly serving production and management (the guidance of production, management of stockpiles, etc.). There is an ever clearer recognition that the utilization of computer technology is a basic tool for increasing the efficiency of production and guidance work. A number of large enterprises have achieved noteworthy results in this area--for example, the Hungarian Car and Machine Factory in Gyor, MAVAG /Hungarian State Iron, Steel and Machine Factories/, the Csepel Works, the Volan Trust, TAURUSZ, etc. It is also a considerable achievement that there has been a great growth in the number of enterprises using computer technology at an initial introductory level. It can also be established that the degree of organization and flexibility have developed better in these enterprises than where computers are not used.

In the area of state guidance it is primarily the functional authorities which have more significant computer technology resources and machines and for this reason applications have achieved a relatively high level here. In these areas (the National Plan Office, Ministry of Finance, Central Statistical Office, Ministry of Labor Affairs) increasingly efficient organization and a suitable use of resources are generally characteristic of the applications.

A crucial role was played in the development of computer technology applications by the fact that, within the framework of socialist cooperation, a third generation ESZR /Uniform Computer Technology System/ machine family of domestic and socialist manufacture came into being in the early 1970's and versions of these, developed further on the basis of applications experiences, are now available. The development of a more uniform computer park became possible on this base, increasing the level of related services, substantially improving software supply and supplementing the tools deriving from the capitalist relationship. The ESZR tools do not entirely satisfy the needs of domestic organizations but they do so increasingly in regard to both technical level and guaranteed services (including basic software supply).

In addition to the positive trends of development we must also call attention to a few negative factors. Applications--especially enterprise applications--are generally at the level of realizing simpler partial data processing systems; few standardized systems are used and the development of uniform methods and standards has not made enough progress. The organizational level of our enterprises and institutions is generally not adequate for complex applications and they concentrate smaller than justified organizational capacity on system development. The coordination of enterprise organizational development, including operational and work organiztion activity and computer technology applications, is developing now but it was not satisfactory earlier.

Nevertheless, the chief goals of the Program for the period up to now were met, a computer technology culture has been adopted here and the conditions for broader applications of computers have come into being. The importance of computer technology applications and their economic and political weight have increased further. So it has become timely to formulate and make concrete, in a manner satisfying the requirements of the central development program, the policy and strategy for computer technology applications in the 1980's.

Nor is it a matter of indifference how the developmental resources of the country, which are expected to be restricted, will be used in computer technology--in which areas, in which directions and primarily at what level of efficiency and thus on what concrete solutions. We should concentrate development in this complex area, where the problems of the general efficiency of enterprise activities increasingly appear and where there are still only initial and limited experiences in reviewing the efficiency of computer applications systems, within the framework of the program.

Because of the sometimes distorting effect of our price and value relationships and because of the frequently unjustified antipathy and lack of information of enterprise leaders in regard to what can be expected from computerization there is not yet sufficient incentive or orientation which would permit the enterprises to select the best solutions for computer technology applications.

With the complex spheres of authority of state guidance and economic guidance, the interdependent fabric of supervisory, branch and functional spheres of authority, it is not automatically guaranteed that the supply of information for state guidance and the technologically most efficient methods for supplying this information will develop efficiently or uniformly throughout the country. The danger exists that various organizations will try to solve these tasks without coordinating with one another in regard to content or in regard to investments in processing systems.

So there is need to implement a comprehensive national policy in the interest of increasing the efficiency of enterprise systems, making more rational use of budget resources and increasing the performance of the systems and there should be an organizational and procedural system, in the form of a central developmental program, to realize this policy.

But there are formidable external obstacles to maintaining the earlier swift pace of development.

In addition to other factors, the high rate of development could be achieved thus far because the existing machines were kept in operation up to the limits of physical wear, over and above the 5 years amortization time at the beginning of the Program, later modified to 7 years. So in the period ahead we must reckon with the fact that there will be a significant increase within our expenditures, as compared to the past, in regard to replacing equipment the scrapping of which was postponed, which is to say the ratio turned to maintaining capacity.

Our development is also significantly influenced by the fact that with the restratification of world economic value relationships the international market has significantly devalued Hungarian work, and we cannot count on a reversal of this unfavorable trend for the time being. For this reason we can increase our computer technology investments more slowly than desired in the Sixth Five-Year Plan too.

For the above reasons the growth rate for the value of active machines will probably fall to an annual 6-7 percent in the Sixth Five-Year Plan--despite total expenditures actually somewhat exceeding investments for 1976-80.

We must say that on a world scale the monetary value of resources turned to manufacture of computer technology tools and to utilization of computer technology is increasing, usually doubling in every succeeding 5 year period, and every sign indicates that the expansion of computer technology is not slowing down. This means an annual growth rate of 14-15 percent.

Another obstacle to our development is the continuing delay in some developments and in the initation of manufacture planned jointly with friendly countries. This is expecially unfortunate in regard to truly large capacity ESZR machine types and large capacity, direct access background storage or disk units.

We have a no smaller problem in the fact that we are still in the initial and partial stages of developing TAF /remote data processing/ systems of socialist manufacture. Since socialist and domestic industry is not ready to deliver complete, tested TAF systems our computerization policy must give up for what is as yet an uncertain time basing its developmental goals on remote data processing or network systems which are a good bit cheaper and which are now considered modern. It belongs to the complete picture that about 6 months ago the Interagency Computer Technology Committee entrusted a special work organ with an analysis of the TAF problem. Since then they have been developing a comprehensive action program or series of proposals which will probably move this problem off dead center.

It would be one-sided to blame only or largely the limitations on computer technology investments, due to the stressed situation of the people's economy, or the deficiencies of domestic or socialist manufacture for the slowdown in our rate of development. Not rarely one must seek the real brake on a swifter development in the faulty preparation by the users, in their unsatisfactory and uncertain readiness to accept it. But we cannot make generalizing statements here because of the large number of and multiplicity of users.

The conception bearing the title "Content and Directions of the Applications Development Program for the Sixth Five-Year Plan" states that the 1981-85 program for computer applications, based on the results achieved within the framework of the SZKFP and taking into consideration our positive and negative experiences, must be developed by taking into consideration the basic economic policy goals of the Sixth Five-Year Plan (primarily, creating a balance, increasing efficiency and the well known limits on assets available for investment).

The program must extend to all essential areas of applications, reckoning with the following facts:

--the majority of the goals which can be put forward in the technical-economic conception for computer technology applications in 1981-85 (looking forward to 1990) should be directed toward the realization or further development of those applications systems which the SZKFP had defined and begun for the period up to 1980 (not all systems developments begun in the Sixth Five-Year Plan will be completed by 1985);

--Developments after 1980 must be largely based on domestic and socialist products (on varieties and program products of computer technology cooperation taking pace within the socialist integration program);

--The replacement of equipment the scrapping of which was postponed earlier, that is the share of expenditures turned to maintaining capacity, will increase significantly in the next period;

--Within the remaining possibilities for new initiatives it is an important requirement that applications development decisions be strictly based on individual judgements of the functional utility and economic efficiency of the computer systems; we should manage the limited central resources according to a rank ordering of the economic importance of the projects or developmental goals. Within this we should encourage computer technology applications where the demand coincides with tools meeting applications needs;

--The quantitative growth in applications has resulted in a situation where central organs will deal with individual problems in the guidance of the program only in exceptional cases (for example, with the 25-30 large enterprises to be emphasized) and thus the role and significance of normative regulation will increase. At the same time there will be an increase in the sphere of tasks and responsibility of the computer technology applications committees of the main authorities.

The comprehensive goals of development must be broken down in a selective manner into concrete tasks striving for a relatively concentrated utilization of resources and priority must be given to those investments which will aid directly and in a short time the following:

--increasing the capacity of comprehensive information systems serving higher, middle level or regional guidance of the economy,

--building up computer guidance and information systems for the most important large enterprises of the economic branches, those with especially favorable properties for improving the foreign trade balance,

--spreading computer guidance of industrial technology, warehousing and material movement processes and computerizing engineering work,

--in the case of new investments or large reconstructions, developing and realizing computerization tasks which are closely linked to them, serve leadership directly, or improve the degree of organization of work processes which are material or energy intensive, and

--buidling up a network of collective computer centers providing computer services to enterprises which do not yet have their own computers or which will start using such computers only later.

Quantitative and Qualitative Characteristics of Applications Development in 1981-85

Those preparing the conception worked out two quantitatively and qualitatively different versions for the solution of the tasks described above. These two versions actually designate the lower and upper limit for development and many combinations are possible between these two limits.

As I have said, the number of computers (exclusive of mini-computers) probably will increase to 715 units by 1980 and from this base the first, smaller volume, development version of the conception prescribes in excess of 900 units by 1985.

In regard to capacity growth (and when weighing investment prescriptions) it must be noted that there will be a great increase in replacements in the 1980's. The prescriptions of the conception propose 275 computers for this purpose. This means that since the capacity of the new computers taking the place of the old ones being scrapped will generally be greater and since their technical level and software supply will be better than that of their predecessors, the total capacity of the machine park may increase substantially more quickly than the growth in absolute numbers.

The number of mini-computers will increase more dynamically than before and since there will be quite a bit less scrapping for the time being it can be expected that the 580 mini-computers estimated for 1980 (there were only 27 mini-computers in the country in 1970) will nearly double by the end of the Sixth Five-Year Plan.

Our backwardness is relatively great in utilization of remote data processing systems. We are counting on about 25 such systems by 1980, with 500 terminals, although according to international data 10 times this number would be

desirable within the given machine park! According to the conception there will be a greater structural change within the machine park during the Sixth Five-Year Plan, characterized by an increase in the ratio of mini-computers and small computers. This structural change will lay the foundations for the expected development of the domestic computer networks in the second half of the 1980's. This positive change could be accelerated by direct linkage to international computer information networks. The technical feasibility of this has been proven experimentally (primarily on the basis of tools of domestic manufacture) and there is no fundamental obstacle on the part of foreign partners. It appears that conditions exist for our homeland to join the international information traffic, after clarification of security, international law, foreign trade, accounting and other problems.

In the Fourth Five-Year Plan applications investments (computer technology tools and other expenditures) came to about 9 billion forints and they are expected to come to about 13 billion forints in the present plan period. Even the lower version of the conception counts on a somewhat higher applications investment than was prescribed by the Fifth Five-Year Plan. Nearly half of this must be used for replacements.

As compared to the Fifth Five-Year Plan there must be an increase in planning and concentration in the case of the still indispensable equipment coming from the capitalist relationship. In addition to the justified acquisition of special tools lacking from the variety (for example, optical character readers, graphic machines, large disk storage which cannot be obtained from the socialist relationship, etc.) capitalist foreign exchange must be used to obtain medium-large and large computer based systems or to build such systems where the compatible procedures will aid the construction of remote data processing systems and networks.

In regard to applications areas the conception emphasizes that one of the fundamental aspects of computer technology applications in our homeland in the years ahead must be increasing the level of the organization and automation of material processes, including primarily processes which directly and indirectly serve production or to increase the efficiency of production, increasing their productivity, increasing the technical parameters and market competitiveness of products and increasing economicalness in production and marketing. In the interest of this special emphasis must be given to enterprise applications including the computerization of enterprise leadership and information systems, technological processes and engineering design work. In the course of enterprise computer development the above areas must be handled in a complex manner; the goals and tasks of and, last but not least, the investment assets for development must be worked out on the basis of a combined survey of the activities.

It can be expected that the computer needs of the enterprises will increase in the Sixth Five-Year Plan period--despite the narrowing of investment possibilities.

In the interest of selecting investments of greater efficiency it would be useful to introduce a method of "screening" for the more important enterprises which require computer acquisition or expansion, for example for the 92 enterprises obliged to prepare medium range plans, as a tool or condition for authorizing or supporting acquisition or expansion.

In the interest of greatly increasing the efficiency of enterprise applications and raising the level of development a special role must be given to the computer technology research and organizing institutes, including the base institutes of the ministries.

During the Sixth Five-Year Plan we must see to it in the enterprise sphere that the most important 25-30 large enterprises in the country, some of which already have computers or have experience with computer technology, develop an integrated information guidance system making use of progressive system organization and program development methods, originating from domestic research and development or acquired from abroad, adapted standard solutions and program products in such a way that other user organizations will be able to acquire the needed experience. Special support must be given to stressed projects in the following way:

--centrally guaranteed professional and methodological support via national and branch base institutes,

--direct support with special R and D achievements,

--ensuring software and organizational know-how under favorable conditions,

--credit preferences (preferring credit according to purpose),

--ensuring the supplementary capitalist imports in case of need,

--bringing them under a preparations, approval and control system based on a system of rigorous methodological requirements, etc.

In addition to the stressed enterprises care must be given to computer development for those enterprises in the material production sphere which have not yet used computer technology but which seem to be ready as a result of the "screening"--on the basis of internal or external initiative. We must see to it that these enterprises prepare systems, so that they can be computerized, which contain resource records, basic inventory systems and certain management or guidance elements.

It would be useful for the creation of new technologies or the reconstruction of old ones to be accompanied by the introduction of computer process control. Experience proves that a computer process control system makes up a relatively small part of the total investment costs and it pays for itself more quickly than the basic technology. In the interest of accelerating the spread of process control it is necessary to:

--study and, where economically justified, plan for investment in technological process control computer technology tools as part of large investments and reconstructions, and

--plan within the framework of the SZKFP and R and D tasks of process control in the interest of laying the foundations for and a swift spread of the technology.

In the area of computer assisted technical planning we must see to it that every interested special branch prepares a developmental conception supported by a detailed analysis (based on conception 16-7602 prepared by the National Technical Development Committee), in harmony with domestic and international achievements and plans.

The increasing demand for computer technology in state guidance is a necessary consequence of the effort aimed at rationalizing, modernizing and simplifying guidance. During the Sixth Five-Year Plan the goal is primarily the stabilization and intensive, coordinated development of information processing systems and the chief developmental directions of computer technology applications can be derived from this, as follows:

--as a continuation of basic work done thus far we must develop the essential information processing systems for economic guidance and popular supply,

--strengthening selectivity in the expansion of ministerial data processing systems, we must make significant progress in building up the bases of functional organs by consolidating the results achieved and concentrating and coordinating information processing,

--it is a basic condition for the realization of long-range goals that progress be made by the end of the plan period in the organization and computer handling of the more significant multiple function national records (the ANH /expansion unknown/, the national real estate registry and vehicle registry, etc.),

-it is increasingly necessary to develop standardized council (regional) data processing systems, coordinating them with the development of the regional segments of large national state administrative systems (for example, the TAKEH--Council Budget Accounting Offices).

In the coming period the significance of the computer technology service organizations and base institutes will increase further partly as a result of the constantly increasing applications needs--of various types--of enterprises which do not have their own computer technology tools and partly because the role of the jobwork network is constantly increasing in the development and operation of national base registries while the sphere of processing done for the ministries and chief authorities is expanding also.

On the basis of the experiences of the Fifth Five-Year Plan raising the level of technical services will make necessary the solution of a number of important tasks.

In the interest of a better preparation for and swifter execution of computer technology investments it will be necessary to make more profound the role of prime contractors. The conditions for marketing computers, putting them into operation and maintaining them must be improved.

The significance of leasing computer technology tools may increase during the Sixth Five-Year Plan, especially with regard to the expected narrowing of enterprise investment possibilities. It is thus necessary to work out leasing arrangements in detail, precisely defining the services to be offered together with the lease (and regulating this at an appropriate level).

The spread of applications, the qualitative changes in them and the spread of remote data processing systems will certainly increase and substantially transform the expectations in regard to experts--and to an increasing degree this no longer means computer technology experts in the strict sense. The conception points out that in a relative sense the significant applications tasks of the Sixth Five-Year Plan must be carried out by decreasing personnel so that a greater role will be played by modern knowledge and the applicability of it. At the same time, a key question for the realization of the applications program is the preparation of the leaders and experts of enterprises and institutions to receive computer technology. The solution of both problems places significant tasks on both school and study course instruction.

Government Resolution No 2038/1971 (XI. 28.) which approved the Computer Technology Central Development Program laid the institutional foundations for state guidance of computer technology applications. These are now organic parts of the system of state guidance and time has proven the theoretical need for state guidance of computer technology applications. This institutional and sphere of authority system has proven itself and it will be definitive for the future also. But ideas pertaining to its further development also found a place in the conception because an adaptation to the timely goals, emphases and methods of solution of our general economic policy require it, certain negative experiences and deficiencies in the guidance of computer technology (and its application) justify it and the new (for example, legal) expectations posed by development make it necessary.

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CSO: 2502

DOMESTIC, IMPORTED UCS COMPUTER ENGINEERING DEVICES AND THEIR EXPECTED DEVELOPMENT

Budapest INFORMACIO ELEKTRONIKA in Hungarian No 4, 1979 pp 189-192

/Article by Zsolt Naray, Director of the Computer Technology Coordinating Institute (SZKI): "Domestic and Imported ESZR (Uniform Computer System) Computer Technology Tools and Their Expected Development"/

/Text/ The well known acronym ESZR is the designation for a computer system built up in accordance with uniform principles which consists of 10-12 central units which can be delivered at present and about 100 peripherals and remote data processing tools performing various functions--and of various parameters within the groups performing individual functions--as well as the required basic and applications software. For years we have been seeing, hearing about or reading of its achievements--and sometimes its real or imagined problems. We are making ever greater use inside the country of a broad spectrum of equipment belonging to the system, and we are successfully manufacturing part of it too. We export about 500 units of those ESZR systems making up the domestic manufacturing task and we produce 5,000 units of the peripherals in our profile.

Today the cooperation can look back on a history of 10 years in the area of the Intergovernment Committee for Computer Technology. It is well known that 10 years ago six European socialist countries decided, at the head of government level, to develop the Uniform Computer System, starting from the idea that only the cooperation of the professional, technological and manufacturing bases of the individual countries and their coordinated market needs could guarantee the conditions for the development of a truly modern system which could be economically produced. The Intergovernment Committee for Computer Technology (SZKB) came into being to guide the cooperation aimed at creation of the ESZR and it entrusted to the Chief Design Council (ESZR-FT), made up of representatives of the individual countries, the tasks of technical realization of the Uniform Computer System. Following this, of course, a number of other working organs were formed within the framework of the SZKB.

In about the middle of the 10 year period of developing the Uniform Computer System it became necessary to develop a machine family smaller than the domain covered by the central units of the ESZR, a family which quickly spread

throughout the world; there are very large numbers of these used in technical and economic areas of almost every country. This is a category generally used but not very precisely defined scientifically, the so-called mini-computers, and to satisfy the needs in this area a new system, which we call the MSZR or Mini-Computer System, was adopted, again within the framework of the Intergovernment Committee for Computer Technology, about 3-4 years later.

The Hungarian People's Republic is taking an active part in the creation, development, manufacture and application of both systems. Within the framework of the Uniform Computer System it generally develops, manufactures and delivers to domestic and foreign users the smallest model of each succeeding generation. In the first ESZR series, the so-called ESZR-I, this model became well known under the designation R-10. In the modernized first ESZR series we participated with the R-12 and following this, to satisfy the ever increasing demand, we brought out the machines designated the R-11 and the R-10 M, as further developed models of the R-10. In the ESZR-II Hungary again got the task of developing and manufacturing, and creating applications conditions for, the smallest member of the series.

When evaluating our present achievements and status it is necessary to glance back for a moment at our situation 10 years ago. At that time isolated groups within the country were working in the area of computer technology, partly on machine development and partly on software development or on developing the hardware and software technology for this. There were even steps to manufacture certain items in small series. These groups were significant from the viewpoint of professional level but they were small in numbers. Among these bases we must mention the Central Physics Research Institute, the work of the collective working as predecessor to the Computer Technology and Automation Research Institute and, in the area of industrial institutions, the results achieved at the EMG /Factory for Electronic Measuring Instruments/ and VILATI /Institute of Electrical Automation/. It was generally characteristic of the situation at that time that there was no national program which would have coordinated the activity of these organs. Naturally they did not have available the necessary variety of peripherals or a series of central units with various performance-price indexes which would have made possible the development of a homogeneous applications culture within the country. The situation was more or less different in the other socialist countries participating in the SZKB. National programs had developed in the Soviet Union, the GDR and Poland and, to a certain extent, in Czechoslovakia and these constituted what amounted to an introductory phase for the later international cooperation.

Evaluating the domestic situation of 1968 it can be said that about a 10 year lag characterized our manufacture and applications as compared to the smaller European countries. The initiative associated with the creation of the SZKB reached us under these circumstances; we could then join the domestic research and development, manufacturing and applications capacity to the realization of developmental, manufacturing and applications tasks of an international cooperation. In addition to the advantages of cooperation it must be mentioned that in the initial period, naturally, we were faced with

very great difficulties because we did not have the experience needed to organize and guide a cooperation which mobilized such a large number of developmental and manufacturing experts. Our difficulties were increased by the fact that within the country--unlike a large part of our partners--there was no uniform organization and no division of labor, on a professional or economic basis, among the institutions working in the area.

Within the framework of the SZKB the first year was spent on a precise outlining of the ESZR system and defining the elements of the system. In this period the international work groups prepared about 15,000 (A4 page) system descriptions, standards, etc. It was characteristic of the pace of the work that within about one year there was a precise definition of the tasks to be carried out and a division of the tasks among the partners and the development of the elements of the system began in the several countries according to uniform work methods and standards set down in the previously mentioned, jointly developed documents. Barely 2 years later it was possible to put together the first operating system using the central units made in various countries--first the R-20--and the appropriate peripherals and a few applications programs were run on this system under the operations program. This initial success greatly inspired the collectives participating in the cooperation; for the first time they felt the effectiveness of coordinated work done as part of a large team. This work, done by large numbers of research and development experts, demanded great professional discipline but its effectiveness brought home to all the participants the difference between uncoordinated work done in small groups and the efficiency of modern research and development activity. This period also confirmed the basic correctness of the methods, standards, system criteria and technological descriptions prescribed for the tools being created in the cooperation. Following the initial results achieved with the R-20 a complete ESZR-I system came into being and it was officially introduced at the first Moscow ESZR exhibit.

The chief Hungarian exhibit there was the R-10. Since then the R-10 family has been further developed in the SZKI on the basis of cooperation with a French firm and has been successfully manufactured by VIDEOTON. The R-10 enjoys wide use; several hundred are being used domestically and in the cooperating socialist countries. It is worth nothing that several hundred institutions in the Soviet Union alone have used the R-10. So it is justified to maintain the applications culture developed for the R-10 and to release new, modern models compatible with the R-10. Development and manufacture of the R-10 M, R-11 and R-12 computers began at various times within the framework of the so-called modernized ESZR systems in the interest of modernizing and improving the technical-economic parameters.

In addition to the members of the R-10 family Hungary uses a significant number of larger ESZR models developed and manufactured in friendly countries. Of these we should mention the already noted R-20, which has now been replaced with a modernized version designated the R-22, and the R-40, which has larger capacity and a very favorable price/performance index. The R-32 is used in university instruction.

It is worth noting again in this connection that these computers and the associated 100 different types of peripherals and remote data processing tools were created by about 25,000 researchers and developers in the very disciplined and precisely regulated work order already mentioned in such a way that the research and development tasks aimed at creating the several tools of the system were carried out in time, parallel to one another, and thus the times required were acceptably brief in regard to the systems.

If, after all this, we want to illustrate the present level of domestic computer technology we might say that the lag has been significantly reduced as compared to the European level--meaning not only the smaller but even the most developed European manufacturers. But what is more significant than this achievement is the fact that a developmental collective able to work in a disciplined division of labor has developed together with a manufacturing base employing about 300,000 persons in the cooperating socialist countries.

The completion of research and development, the completion of introductory manufacture and putting the products to use quickly proved that the configurations developed from the ESZR-I were able to satisfy in an acceptable way the most important economic tasks. At the same time, however, following the very swift development of computer technology throughout the world and even before completing the full utilization of the ESZR-I system the research and development laboratories had to begin modernization of it. We began this activity in the FSZR-FT from the position that user experience represented the greatest value in a system. This is represented by those using the ESZR-I, trained operators with experience and the user software packages developed for these machines. As a consequence the chief criterion for modernization was to put out equipment with better technical and economic parameters (that is, the machines should have favorable price/performance indexes, should be reliable, etc.), they should ensure full utilization of the user systems already available in every respect, which is to say--to use a "technical term" which is frequently misinterpreted--the modernized versions of the ESZR-I should be compatible with the ESZR-I user systems. The so-called modernization phase ended successfully about 2 years ago. Today, the machines being used in ever larger numbers in the cooperating countries are almost without exception members of the so-called modernization ESZR-I. It is worth noting that thousands are using these machines in the various countries. At the same time, maintaining the previously mentioned compatibility requirements, one can see that there is also a need for basic further development. For this reason development of the ESZR-II began in the middle 1970's. Several members of this machine family are already well known; the introduction of manufacture has been completed in some countries and series manufacture of the new models has begun. The realization of this process can be expected in Hungary too in the near future although the marketing of new models is not yet urgent for economic, testing time or initiation of manufacture reasons due to the modernization and significant success of the already mentioned three versions of the R-10.

The joint development of the MSZR began in the middle 1970's, as we have already mentioned, essentially in parallel with the developmental process described above in connection with the ESZR.

The first generation of this system, the MSZR-1, contains a number of central units, the appropriate smaller peripherals and process control tools. In many respects the technical-economic demands made of this system are more heterogeneous than in the case of the ESZR. The ESZR was designed for those computer technology tasks which represent the overwhelming majority in the economies of the several countries, data processing, and to carry out scientific and technical calculations. The requirements in the case of the MSZR are process control, certain data transmission and measurement data collection tasks, data preparation and data collection. Since these tasks must be carried out economically with a relatively small tool value it was necessary to develop a series consisting of a relatively larger number of models. The system for some members of the series had to be heterogenous to fit certain applications problems in an economical manner.

A respectable number of MSZR-I units are already operating in the factories, plants and various institutions of the countries participating in the cooperation.

Starting from considerations similar to those already mentioned in connection with the ESZR the development of the MSZR-I and the spread of the peripherals were not entirely completed before the cooperating research and development base began development of the next series of mini-computers, the so-called MSZR-II. Making use of the newest technology they tried, with the latter, to develop multi-purpose central units and they tried to bring the peripherals and data transmission tools of the MSZR and the ESZR closer to one another in what could be called a common performance/price domain. As a result they are preparing a series of peripherals in two versions (one for the ESZR and one for the MSZR, with further sub-variants for the different generations of these) which can be used with both the MSZR and the ESZR. This trend must be continued in the future and it has become necessary to ensure that the MSZR and ESZR machines can be used in larger systems, connected in a hierrarchical fashion, with favorable technical-economic parameters to satisfy user needs. Very significant applications activity has contributed to the work outlined above in the case of both systems. Large numbers of users have received training in the various systems of the ESZR and, more recently, of the MSZR in the most varied areas needed for the application of computer technology. As a result of this there are a number of applications systems--on the order of hundreds even in our homeland--which use a homogeneous tool base (largely equipment in the ESZR list) for the solution of various concrete and economically significant tasks. This same process has begun in the past 1-2 years in the MSZR area, although by the nature of the problem it is well known that process control and data collection are generally linked to large projects and large investments and thus development, applications and realization are to a significant extent more individualized than in the case of the introduction of a manufacturing control system in factories which are different in regard to their final products but similar in other respects (organization, etc.).

Making use of the results achieved thus far the chief task at present is to provide further aid to applications. By this I do not mean that the users alone must take steps to ensure an increase in efficiency but rather that all experts participating in the chain of computer technology development, from those developing theoretical systems conceptions to those providing customer services, must concentrate on making applications more efficient while making use of the tools now available and increasing economic efficiency. The further developed hardware elements should serve this also in the sense that there should be printers, storage devices and other functional elements, performing essentially identical functions, in various performance/price steps meeting the needs of various users. This also makes necessary a survey of the market needs to be expected. It is also necessary to develop the various programming tools and diagnostic tools to prevent or correct errors, which make possible operational systems and time-sharing systems, in such a way that they are "close to" the users on the one hand and, on the other hand, ensure the attainment of the above mentioned goals with favorable economic conditions for both user and manufacturer. It must be emphasized here that an external storage series or printer series which contains an excessive number of elements, to mention the two simplest examples, may make it possible to offer or connect a storage or printer unit with optimal performance parameters for tasks to be carried out on every single system but at the same time a breakdown into an unjustifiably large number of different types with insignificantly different specifications will lead to a situation where the manufacturing series size for individual concrete models will not reach that magnitude which is an indispensable condition for economical manufacture. The same applies, naturally, to other tools as well.

It must be emphasized that there exists a good bit more complicated version of this same problem--very obvious in the case of hardware--in the area of user software. It is well known that throughout the world applications systems are increasingly based on standard applications systems. This means that the task is formulated in very general terms and very complex standard user software is prepared on this basis. User programs for concrete cases are prepared from these in accordance with the needs of the user on the basis of compilation or, to use the technical term, generalization. It follows that very many users receive the same complex software product, adapted to their own tasks, while the whole has the character of "ready-made tailored clothing"--to use a clothing industry simile.

But here, due to the problems of the initial period and the delay in the development of domestic versions of user software, some of the users are used to "cut to measure" rather than ready-made clothing, which is to say that individual software is prepared for virtually every application. This state of affairs may have had certain advantages in the initial period since the software experts working for the users got direct experience with the machines and with programming. But later this attempt to create individual software differentiated user needs unjustifiably. There are obviously two extremes: applications software independent of the needs of the user and his concrete tasks and separately developed software for every single task--which come up again and again for innumerable users at the level of the people's

economy. It would be useful to choose a rational middle path between these two. According to the practice which has developed throughout the world the most effective procedure is software generalization or application of standardized applications program packages for concrete tasks in the case of typical tasks (such as wage management, bookkeeping, production control, etc.). Naturally the problem mentioned is not the only difficulty in the area of applications, considering the recent successful developments.

There are certain contradictory aspects to computer technology. On the one hand one can observe a swift development of computer technology tools--sometimes for a single purpose--which is accompanied by a good bit slower development in the area of applications. In this way the various developers, manufacturers and commercial organizations try to supply their users with modern tools--naturally keeping within sphere of economic, market and technological possibilities--while the existing applications systems have a stabilizing effect on activity which would modify, transform or further develop the system. This factor, understandable in itself, has had a effect on the ESZR since the beginning of the cooperation.

In the initial period of the cooperation, as we have mentioned, the individual countries were occupied with their already existing tools; in the case of more than one country their users were already using a significant number of such tools; thus, together with the development of the ESZR system, almost all the developmental and manufacturing collectives had to attend to the use status of systems produced as a result of earlier activities, primarily in their own countries but also in some of the partner countries participating in the cooperation. It followed from this that this held back somewhat their adapting to the common system and this could be experiened, in the well known way, in their activity within the country too. Nevertheless the trend which can be observed in this regard is quite positive. During the past 10 years the overwhelming majority, in regard to both volume and value, of computer technology tools (hardware and software) coming into being in most countries has consisted of uniform system products and the collectives within the several countries are coming ever closer to one another in their way of thinking, in their technology, in their concrete technical-economic goals and in the detailed specifications of the succeeding generations of tools. This can be expected to increase even further with the ESZR-II and the succeeding systems and thus the contradictions still appearing here and there in our activity will decrease further and, hopefully, will entirely disappear.

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